Drink and deposit

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Must the recovery of valuable cans and bottles be such an intractable challenge?

Two thirds of beverage packages never reached a recycling plant in the US last year. If they had been recycled, then the US could have saved enough energy and fuel to supply power for over two million American homes for one year. Could a nationwide deposit programme be the answer?

Americans lead the world in consuming packaged beverages. In 2004, US consumers used up over 200 billion packaged drinks, or about 700 per person. This is 38% more than the average Canadian, twice as many as the average Brazilian, and almost five times as many as the average Chinese – although they are gaining ground fast (Figure 1). Americans are also a leader in generating packaging waste. More than two thirds of the beverage packages sold in the US never see the inside of a recycling plant – instead they end up buried in landfills, burned in waste-to-energy plants, or strewn as litter across the landscape.

'Recycling options have failed to keep up with growing consumption'

Recycling options have failed to keep pace with growing consumption, and container waste has surged. In 1990, 100 billion beverage containers were wasted in the US; by 2004, wasting surpassed 130 billion, amongst this was 55 billion cans, 40 billion PET bottles, and 35 billion glass bottles. The rapid growth in PET and aluminium wasting is illustrated in Figure 2. When HDPE plastic, foil pouches, aseptic boxes, and paper cartons are included, annual wasting surpasses 150 billion units.

This trend may surprise international readers, as it does some Americans. This is because in the decade following the infamous Mobro garbage barge incident of 1987 – in which a barge containing about 3000 tonnes of baled waste exports from Long Island had to eventually ship the waste back after a 9500 km, four-month journey along the Atlantic and Gulf Coasts – ambitious efforts were made to develop and promote kerbside recycling. In 1990, about 2700 kerbside programmes were serving 15% of the US population; by 2000, almost 10,000 programmes were serving half the population.

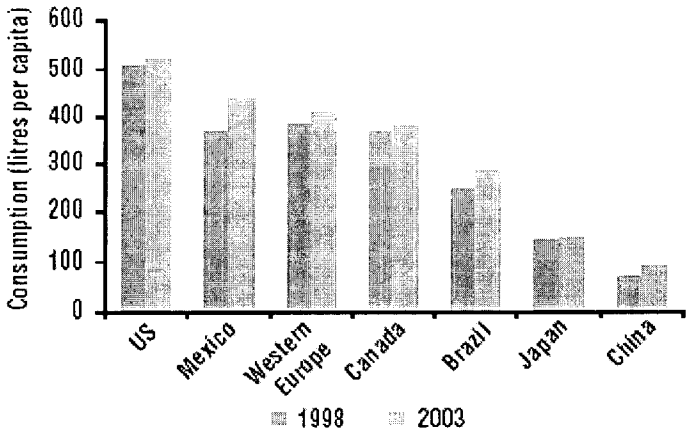

FIGURE 1. Packaged beverage consumption in selected countries.[1] Includes carbonated soft drinks, beer, bottled water, juice beverages, milk, wine and distilled spirits. Excludes ready-to-drink packaged coffee and tea, sports drinks, wine coolers and sparkling wines

Yet this dramatic growth in kerbside recycling coincided with a decrease in recycling rates for all three major container types (Figure 3). Recycling of aluminium cans fell from a high of 65% in 1992 to 44% in 2003. PET recycling – once technologically unfeasible – beat the odds and achieved 37% recycling in 1995, but from then on it declined steadily to 20% in 2003. Glass bottle recycling tumbled from 31% in 1995 to 21% in 2001, to perhaps even lower today.

SOCIAL CHANGES SPUR INCREASED CONSUMPTION

This apparent paradox can be attributed to industry marketing and changes in consumer behaviour. Americans are commuting longer distances, and the use of on-the-go meals and snacks have risen. Vending machines have become ubiquitous, and convenience stores burgeon with a dizzying array of single-serving 'new age' beverages: herbal teas and energy drinks, juices both mundane and exotic, and waters containing every conceivable combination of colour, flavour, vitamins and carbonation. Sales of bottled water hit 20 billion in 2004, five times the amount sold in 1997. Since 1990, total per capita consumption in the US has increased by 23%.

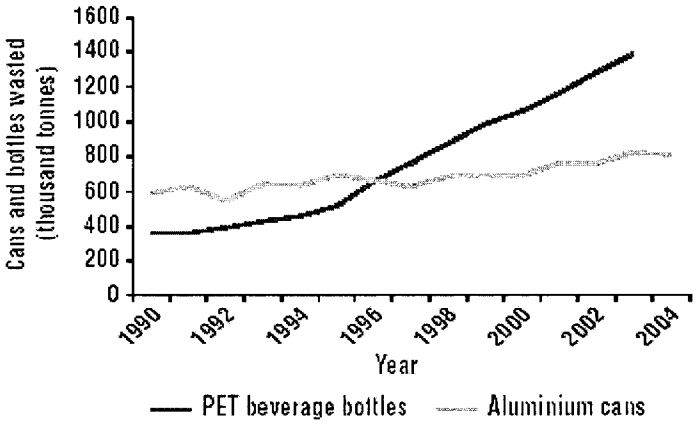

FIGURE 2. Wasting of aluminium cans and PET beverage bottles in the US, 1990–2004 [2]

WATER, WATER, EVERYWHERE – BUT NOT A RECYCLING BIN IN SIGHT

Most institutions have failed to adapt to these changes. In light of acute budget shortfalls, most local governments cannot afford to service recycling bins in public places. Commercial establishments have not met the challenge either, in part because they haven't been mandated to, and in part because they have little financial incentive to do so. With the advent of 'megafills' – giant landfills accepting waste from hundreds of miles away – the landfill capacity shortage of the 1980s was alleviated, and garbage tipping fees did not escalate across the country as had been predicted. This placed recycling at an economic disadvantage. Finally, the beverage and retail industries have resisted making internal changes to encourage recycling, and they have lobbied against state policies – such as deposits – that would increase recycling. As a result, US percapita container wasting has increased by 63% since 1990.

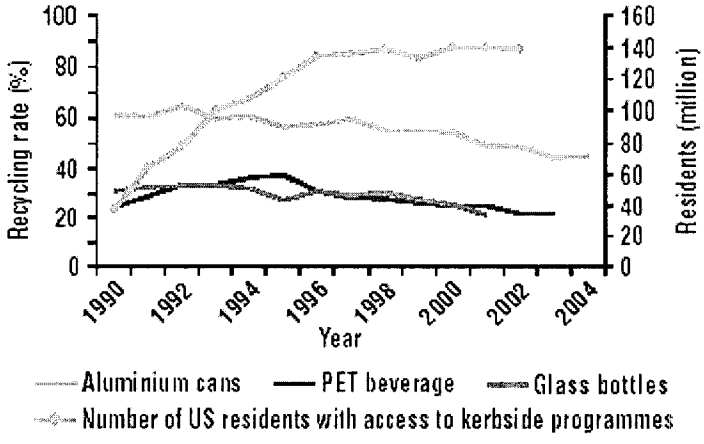

FIGURE 3. Access to US kerbside recycling programmes and the decline of beverage container recycling rates, 1990–2004 [3]

WASTING BY NUMBERS

Glass

According to data from the US Environmental Protection Agency, wasting of glass beverage bottles rose from 4.4 million tonnes in 1995 to 5.5 million tonnes in 2001, the most recent data year. Glass recycling has been hampered by a number of factors, including cheap raw materials, a glut of mixed-colour glass due to the proliferation of kerbside programmes (which occurred simultaneously with the loss of market capacity), and contamination from single-stream waste. This has led to depressed (and sometimes negative) scrap values for kerbside-recycled glass, to an increased glass usage as daily landfill cover, and to a growing number of communities dropping, or considering dropping, glass collection. Meanwhile, glass generated through deposit systems continues to command premium prices.

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PET

The rapid growth in the consumption of bottled water and 'new age' beverages, coupled with the away-from-home consumption trend, has led to a tremendous increase in PET plastic bottle usage. The growth in PET wasting has far outstripped recycling gains. From 1990 to 2003, sales of PET beverage bottles quadrupled from an estimated 952 million to 3517 million pounds (432 million to 1595 million kg), while recycling and wasting increased by 520 million pounds (236 million kg) and 2045 million pounds (928 million kg). This has led to increased litter, greater burdens on municipal garbage

and recycling haulers, and the increased use of petroleum for resin.

Aluminium cans

In 1990, 33.8 billion cans weighing 539 thousand tonnes were wasted. By 2003, wasting had risen to 55.3 billion cans, or 744 thousand tonnes of metal. In 2004 however, the national recycling rate for cans increased by 1.2%, and its wasting declined to about 735 thousand tonnes. Although the aluminium industry hailed this as progress in the right direction, this 10-thousand-tonne decrease in wasting is the proverbial 'drop in the bucket'. A modern primary aluminium smelter is capable of producing 200,000–300,000 tonnes of ingot a year; thus Americans are wasting a quantity equivalent to the amount produced by three to four major smelters each year. Meanwhile, new smelters are on the drawing boards in Iceland, Brazil, Russia and elsewhere: many with their own sprawling bauxite mines, alumina refineries, hydro electric dams and other infrastructure – and a concomitant set of environmental impacts. To prevent unnecessary environmental damage at a regional and global scale, the demand growth in primary aluminium must be curtailed. To do this, hundreds of thousands of tonnes of additional aluminium must be recycled, not just tens of thousands.

At the airport in Los Angeles, California, a beverage display case is flanked by two trash cans but no recycling bins.
PHOTO: JENNY GITLITZ

Putting it all together

Had the 130 billion beverage containers wasted in the US in 2004 been recycled, the equivalent of 36 million barrels of crude oil could have been saved – enough to supply energy for over two million American homes for one year. About 6 million tonnes of greenhouse gases, hundreds of thousands of tonnes of NOx, SOx, and many other pollutants, could also have been avoided.

Unfortunately, these 'upstream' environmental costs have not figured into the sustainability agendas of major glass, plastic and aluminium companies, their trade associations, or government agencies who set recycling goals. The container manufacturing, reclamation, and beverage industries typically overstate the impact of small recycling gains, and government agencies tend to set weight-based diversion goals for the waste stream as a whole, rather than for specific materials or products based on their relative environmental impacts.

Beverage container litter accumulated beneath a tree at a popular recreational area near the Colorado River in Moab, Utah, one of 39 US states lacking a deposit system.
PHOTO: SARA MELNICOFF

LOST ECONOMIC OPPORTUNITIES

In the early 1990s, solid waste officials devoted much attention to developing markets for materials that were suddenly being collected in record quantities. They encouraged minimum recycled-content standards for paper and glass, and developed government procurement policies as well as tax credits for new recycling facilities. Private industry took part as well, developing the capacity for plastics reclamation from the ground up.

Fifteen years later, the situation is reversed. Markets for uncontaminated containers are strong, but collection is lagging. Amcor's reclamation plant in Novi, Michigan, closed in 2004 due to insufficient domestic supply of reclaimed PET and to competition from Asian markets; other reclaimers also face supply shortfalls.

At a rough market price of 50 cents/pound ($1.1/kg) for aluminium and 10 cents/pound (22 cents/kg) for PET, Americans burned and buried over $1 billion in gross scrap revenues in 2004. But with landfill costs not having risen as quickly as predicted, there is little economic incentive for the American society to strive to raise the recycling rate above the current national average of 34%.

COMPARATIVE RECYCLING RATES IN DEPOSIT AND NON-DEPOSIT STATES

The national average leaves out important detail, however. Beverage container recycling rates in 'bottle bill' states are much higher. In 11 US states,[4] consumers pay a refundable deposit ranging from 4 to 10 cents for each beverage container they purchase at the retail level or through a vending machine. They can then redeem the container for 100% of the deposit value at a retail store, or at special redemption centres established for the purpose. Redemption rates range from 60% in California, where the deposit was as low as 2.5 cents until 2004; to 69% in New York and Massachusetts, where the deposit is 5 cents; to over 95% in Michigan, the only state with a 10¢ deposit.[5] Kerbside recycling programmes in these same deposit states boost the beverage container recovery rate even higher. In contrast, beverage container recovery in non-deposit states averaged only 22% in 1999, according to a 2001 multistakeholder study by Businesses and Environmentalists Allied for Recycling (BEAR).[6]

Volunteers pose with their findings after an Earth Day litter clean-up along the Charles River in Boston, Massachusetts. The small bag on the right contains littered deposit containers, the three large bags on the left contain non-carbonated containers excluded from the Massachusetts bottle bill.
PHOTO: RUSS COHEN

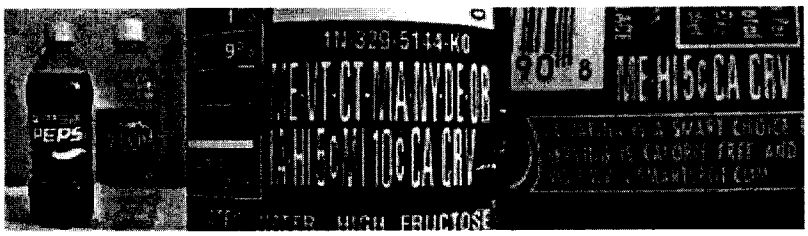
Americans burned and buried over $1 billion in gross scrap revenues in 2004

Economical and effective

The BEAR study also found that deposit states recycled an average of 490 beer and soda containers per capita in 1999 at a cost of 1.53 cents/unit, while non-deposit states recycled 191 per capita at an average unit cost of 1.25 cents.[6] In other words, at an additional cost of about 1.5 cents per six-pack, the recovery rate in 'bottle bill' states is more than two and a half times higher than in non-deposit states.

An intractable controversy?

Despite this record, deposits remain mired in controversy. The political and financial prowess of the beverage and retail industries has proven a formidable obstacle for civic groups and legislators seeking to enact new deposits. Although hundreds of proposals have been introduced in state legislatures over the last 35 years, few ever make it out of committee. The same holds true for all but two states seeking to update their deposits to include 'new age' beverages: Maine and California are the only states to have successfully added noncarbonated beverages to their existing deposit programmes. Proposals to enact a federal 10-cent deposit system have also met the same fate: for two successive Congressional sessions, Senator Jim Jeffords has introduced the National Beverage Producer Responsibility Act, which would place a 10-cent deposit on beverage containers and set a recycling performance standard of at least 80% for all states, but the proposal has not passed out of committee.



These two PET bottles are physically identical and are both produced for PepsiCo. However, the Pepsi bottle is subject to a deposit in 11 US states, while the Aquafina water bottle has a deposit in only three states, as shown in the bottle labels respectively. Neither has a deposit fee in the other 39 states. PHOTO: JENNY GITLITZ

Ironically, processors of glass, plastic and aluminium, as well as container manufacturers who benefit most from deposit recovery, have not publicly supported these laws for fear of losing their biggest customers: the brand-owner giants Coca-Cola, Pepsi and Anheuser-Busch, who in turn are under pressure from bottlers and distributors. Because the deposit states are not geographically contiguous, bottlers and retailers warn that any new law would bring about border flight and lost business.

This would of course be moot if there was a national deposit system to level the playing field. With the imminent resignation of Senator Jim Jeffords – the staunchest champion of a national deposit – such a law will not soon come to pass. In the meantime, ragtag bands of recycling activists and maverick policymakers are juggling efforts to pass new and updated deposit laws, and to stave off industry attempts to repeal them altogether.

A NATIONAL DIALOGUE WHOSE TIME HAS COME

Several national dialogues on the slumping rates of beverage container recycling have fallen far short of consensus. In 2002, the BEAR effort fizzled out after the first study phase due to acrimony over how the conclusions were interpreted. In 2004, a dialogue involving the US EPA and a group of states stalled due to lack of funding, the refusal of the beverage industry to participate, and the exclusion of environmental groups. In 2003, the Beverage Producers Environmental Council (BPEC) was formed by the major beverage producers, with guidance from the Executive Director of the National Recycling Coalition, to discuss ways to increase beverage container recycling. BPEC's efforts, however, have been regarded with a high level of skepticism by the recycling community due to the group's slow pace and the complete secrecy in which it has operated.

BELOW A customer feeds bottles and cans into a reversevending machine at a grocery store in Michigan. He will receive a chit redeemable for cash inside the store.
PHOTO: TOMRA NORTH

This past spring, the US EPA began facilitating a new round of talks. Three meetings have been held already – one with recycling processors, one with state agencies, and one with non-governmental organizations – and others may be scheduled. This is a welcome development because leadership is sorely needed to reverse the wasting trend. It remains to be seen whether this dialogue will succeed where others have failed.

Leadership is sorely needed to reverse the wasting trend

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NOTES

1. Information from Beverage Marketing Corp., Canadean, and Beverage Digest.
2. Figure derived by the Container Recycling Institute, using data from the Aluminum Association, the US Department of Commerce, and the National Association for PET Container Resources.
3. Figure derived by the Container Recycling Institute, using data from the Aluminum Association, US Department of Commerce, US EPA Office of Solid Waste, American Plastics Council, National Association of PET Container Resources, Glass Packaging Institute, US Census Bureau, and *BioCycle* magazine.
4. The deposit states are California, Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, Vermont and Hawaii, whose deposit system began operating in January 2005.
5. Figures from the New York State Department of Environmental Conservation, Massachusetts Department of Environmental Protection, and California Department of Conservation.
6. 'Understanding Beverage Container Recovery: A Value Chain Assessment Prepared for the Multi-Stakeholder Recovery Project, Stage 1.' Businesses and Environmentalists Allied for Recycling (BEAR), a Project of Global Green US, 16 January 2002.

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